

REMARKS

Claims 1413, 1488, 1489, 1500, 1583, 1688, 1709, and 1751 have been amended. Claim 1440 has been canceled. Therefore, claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are pending in the case. Further examination and reconsideration of pending claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are hereby respectfully requested.

Section 103(a) Rejections:

Claims 1413-1420, 1424, 1433, 1436-1438, 1443, 1450-1451, 1478-1482, 1487-1488, 1500, 1583, and 1688 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,748,318 to Maris et al. (hereinafter "Maris") in view of U.S. Patent No. 4,468,120 to Tanimoto et al. (hereinafter "Tanimoto"). Claims 1421-1423, 1425-1432, 1434-1435, 1439-1442, 1444, 1445, 1447-1449, 1452-1477, 1483-1486, 1489-1499, 1709, and 1751 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Maris and Tanimoto in view of U.S. Patent No. 5,872,632 to Moore (hereinafter "Moore") and U.S. Patent No. 4,865,445 to Kuriyama et al. (hereinafter "Kuriyama"). Claim 1440 was canceled; thereby rendering its rejection moot. As will be set forth in more detail below, the §103(a) rejections of claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are respectfully traversed.

To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The cited art does not teach or suggest all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

The cited art does not teach or suggest a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device. Amended independent claim 1413 recites in part:

wherein the measurement device is configured to generate one or more output signals in response to the detected energy during use; and a processor coupled to the measurement device and configured to determine a first property, a second property, and a third property of the specimen from the one or more output signals during use,... wherein the second property comprises a presence of defects on the specimen, wherein the defects comprise macro defects on a front side of a specimen, wherein the defects further comprise micro defects or macro defects on a front side of the specimen, wherein the specimen comprises a wafer.

Amended independent claims 1500, 1583, 1688, 1709, and 1751 recite similar limitations. Support for the amendments to these claims may be found, for example, in claims 1440 and 1489 as originally filed.

Maris discloses an optical stress generator and detector. Maris, however, does not disclose a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device. For example, Maris states that "the physical properties of the sample 51 which may be determined in this way include...interfacial contaminants." (Maris -- col. 9, line 66 - col. 10, line 6.) Therefore, Maris discloses detecting defects at an interface between two layers or between a layer and a substrate. However, Maris does not disclose detecting defects on a back side of a wafer (i.e., a surface of a specimen on which semiconductor devices will not be or are not formed). As such, Maris does not teach or suggest a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Therefore, Maris does not teach all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751.

In addition, Maris does not suggest or provide motivation for all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751. For example, Maris does not suggest the desirability of determining a presence of macro defects on a back side of a wafer. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). MPEP 2143.01. Therefore, even if Maris could be combined or modified to teach the limitations of the present claims, the resultant combinations or modifications are not obvious since the prior art does not suggest the desirability of such combinations or modifications.

In addition, Maris cannot be combined with Tanimoto to overcome the deficiencies therein. For example, Tanimoto discloses a foreign substance inspecting apparatus. Tanimoto, however, does not disclose a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device. For example, Tanimoto states that "the laser light 1 obliquely incident on a pattern surface S_1 having a light-intercepting layer 5b applied to the glass substrate 5a of the photomask 5 is regularly reflected by the glass substrate 5a." (Tanimoto -- col. 7, lines 15-18.) Therefore, Tanimoto discloses that the illumination is directed at surface S_1 of photomask 5, as shown in Fig. 4 of Tanimoto. Tanimoto also states that "a light-receiving portion B...is opposed to the surface S_2 of the glass substrate 5a opposite to the pattern surface S_1 . This light-receiving portion B...obliquely looks to the portion irradiated with laser light 1 from the surface S_2 side." (Tanimoto -- col. 7, lines 32-40). Therefore, Tanimoto discloses that light-receiving portion B detects light passed through the glass substrate, as shown in Fig. 4 of Tanimoto. However, no such light will be passed through an opaque specimen such as a wafer from one side to the other. Therefore, if the systems of Tanimoto are used to inspect a wafer, light-receiving portion B will not detect any light thereby preventing detection of defects on at least one of the two sides of the wafer. As a result, the systems disclosed by Tanimoto cannot be used to detect defects on both sides of a wafer (i.e., the front side and the back side). Therefore, Tanimoto cannot teach determining a characteristic of defects on two sides of a wafer. As such, Tanimoto does not teach a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Consequently, Tanimoto does not teach all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751.

Furthermore, there is no suggestion or motivation to modify Tanimoto such that Tanimoto teaches all limitations of the present claims. For example, the teachings of Tanimoto are not sufficient to render the claims *prima facie* obvious. In particular, as set forth in more detail above, the systems of Tanimoto cannot detect defects on two sides of an opaque specimen such as a wafer since "photoelectric means disposed so as to look to the other surface from which the light beam passed through the object to be inspected emerges" (Tanimoto -- col. 2, lines 35-37) would not receive any light. As a result, this photoelectric means will not produce photoelectric signals. In addition, the systems of Tanimoto include "a detecting device for comparing the photoelectric signals of said first and second photoelectric means and producing a detection signal corresponding to the adherence conditions of the foreign substance."

(Tanimoto -- col. 2, lines 38-42). Therefore, if one of the photoelectric means does not produce photoelectric signals, then the detecting device cannot produce signals corresponding to defects. Consequently, the systems of Tanimoto would be unable to detect defects on the wafer. Therefore, the principle of operation of the systems of Tanimoto would be modified if the systems are used to inspect an opaque specimen such as a wafer. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). MPEP 2143.01.

Additionally, since using the systems of Tanimoto to inspect an opaque specimen such as a wafer would render the systems of Tanimoto unable to detect defects on the wafer, such a modification of Tanimoto would render the system of Tanimoto unsatisfactory for its intended purpose. For example, Tanimoto states that "It is a primary object of the present invention to provide an inspecting apparatus which can quickly detect any foreign substance adhering to the surface of an object to be inspected having a light-transmitting property." (Tanimoto -- col. 1, lines 64-68, emphasis added). Therefore, there is no motivation to use the systems of Tanimoto to detect defects on two sides of an opaque specimen such as a wafer. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). MPEP 2143.01.

In addition, Maris and/or Tanimoto cannot be combined with Moore and/or Kuriyama to overcome the deficiencies therein. For example, Moore discloses a cluster tool layer thickness measurement apparatus. Moore states that "This invention related generally to determining the quality of layers deposited on a substrate and in particular to measuring the thickness of a layer deposited on a substrate." (Moore -- col. 1, lines 7-9.) Therefore, Moore teaches measuring a thickness of a layer on a substrate. However, Moore does not teach a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Consequently, Moore does not teach all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751 and cannot be combined with Maris and/or Tanimoto to overcome deficiencies therein.

Kuriyama discloses an apparatus for detecting faults on the surface of a resist master disc and measuring the thickness of the resist coating layer. For example, Kuriyama states that "it is necessary, in the process of producing the master disc, to detect the presence of faults such as dust, defects, or flaws on the surface of the master disc which may cause a drop out." (Kuriyama -- col. 1, lines 33-38.) Therefore, Kuriyama discloses detecting defects on a front side of a master disc. However, Kuriyama does not teach a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Consequently, Kuriyama does not teach all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751 and cannot be combined with Maris, Tanimoto, Moore, or any combination thereof to overcome deficiencies therein.

Therefore, none of the cited art, either individually or in any combination thereof, teaches, suggests, or provides motivation for a processor coupled to a measurement device and configured to determine a presence of macro defects on a back side of a wafer and a presence of micro defects or macro defects on a front side of the wafer from one or more output signals generated by the measurement device, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Consequently, the cited art does not teach, suggest, or provide motivation for all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751.

For at least the reasons stated above, claims 1413, 1500, 1583, 1688, 1709, and 1751 are patentably distinct over the cited art. Therefore, claims 1414-1439, 1441-1445, and 1447-1449, which depend from claim 1413, are also patentably distinct over the cited art for at least the same reasons. Accordingly, removal of the § 103(a) rejections of claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 is respectfully requested.

Information Disclosure Statements

Applicants note that the Information Disclosure Statements filed on March 28, 2003 and June 20, 2003, and the references cited therein, have not been considered by the Examiner. Careful consideration of the references listed on the Forms PTO 1449 of these Information Disclosure Statements and return of the signed pages are respectfully requested.

CONCLUSION

This response constitutes a complete response to all issues raised in the Office Action mailed February 23, 2004. In addition, the art cited but not relied upon is not believed to be pertinent to the patentability of the present claims. In view of the remarks traversing rejections presented therein, Applicants assert that pending claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned earnestly requests a telephone conference.

The Commissioner is authorized to charge any required fees or credit any overpayment to Conley Rose, P.C. Deposit Account No. 03-2769/5589-02305.

Respectfully submitted,



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